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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Robert Palifka

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EXAMINER

NGHIEM, MICHAEL P

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/749,893	<b>Applicant(s)</b> PALIFKA ET AL.	
	<b>Examiner</b> MICHAEL P. NGHIEM	<b>Art Unit</b> 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29,32,33,35,36,38,39,41-43,45,48,50-52,54-58,60,61,63-65,85-87,92-99 and 110-115 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Continuation of Disposition of Claims: Claims pending in the application are 29,32,33,35,36,39,41-43,45,48,50-52,54-58,60,61,63-65,85-87,92-99 and 110-115.

## **DETAILED ACTION**

The Amendment filed on January 25, 2008 has been acknowledged.

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 25, 2008 has been entered.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 110-112 and 115 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claims 110 and 115 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the second thermoplastic bonding component is not related to other limitations.

The remaining claims are also rejected under 35 U.S.C. 112, second paragraph, for being dependent upon a rejected base claim.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 41, 42, 51, 63, and 64 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 41, 51, and 63, “the land between each pair of adjacent units is at least 50 microns”.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 29, 33, 35, 36, 38, 39, 45, 48, 50, 52, 54-58, 60, 61, 85-87, 92-96, and 110-115 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. (US 6,755,511) in view of Baker (US 6,084,618).

Regarding claims 29, 45, and 52, Moynihan et al. discloses an apparatus (ink jet head, Fig. 1) and method (Fig. 1) comprising a piezoelectric element (34, 34') and a first bonding component heat-bonded to a surface the apparatus (column 3, lines 2-3);

wherein the apparatus further comprises an ink channel (33, 33'), the piezoelectric element being positioned to subject ink within the channel to jetting pressure (column 2, lines 31-33), and

electrical contacts arranged for activation of the piezoelectric element (column 2, lines 44-49).

Regarding claims 33 and 93, Moynihan et al. discloses the first bonding component has a thickness between 10 microns and 125 microns (15 microns, column 5, lines 64-67).

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Regarding claims 38, 60, and 96, Moynihan et al. discloses a series of channels (Fig. 3).

Regarding claims 39 and 61, Moynihan et al. discloses each of said channels is covered by a single piezoelectric element (34, 34', Fig. 2).

Regarding claim 45, Moynihan et al. further discloses contacting a first component (10) of an ink jet printing module having a surface (Fig. 1) (column 2, lines 28-32).

Regarding claims 52, 110, and 115, Moynihan et al. further discloses a second bonding component (Figs. 1, 2).

Regarding claim 55 and 111, Moynihan et al. discloses the second bonding component includes a first surface heat-bonded to the surface of the piezoelectric element and a second surface heat-bonded to a surface of an ink jet printing module component (column 3, lines 2-3; Fig. 1).

Regarding claim 56 and 112, Moynihan et al. discloses the second bonding component includes an electrode pattern (electrodes on bonding material, column 2, lines 58-63; column 3, lines 4-8).

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Regarding claim 87, Moynihan et al. discloses the surface and the first bonding component are substantially free of liquid adhesive (when they are bonded and cooled).

Regarding claims 92 and 113, Moynihan et al. discloses the first bonding component has a thickness between 1 micron and 150 microns (15 microns, column 5, lines 64-67).

However, Moynihan et al. does not disclose:

- regarding claim 29, 45, and 52, the first thermoplastic bonding component covering the ink channel and includes a filter.
- regarding claims 35, 54, and 94, the first thermoplastic bonding component has a thickness between 20 microns and 50 microns.
- regarding claims 36, 58, and 95, the first thermoplastic bonding component includes an adhesive polyimide.
- regarding claims 48 and 114, the first thermoplastic bonding component includes a plurality of openings.
- regarding claim 50, the filter includes a repeating pattern of units having a plurality of openings.
- regarding claims 52, 110, and 115, a second thermoplastic bonding component heat-bonded to the surface.
- regarding claim 85, applying pressure to the surface and the first thermoplastic bonding component.



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- regarding claim 86, pressure is applied during heating.

Nevertheless, Baker discloses the first thermoplastic bonding component (column 3, lines 34-37) covers the ink channel (Figs. 1, 2) and includes a filter (32), the first thermoplastic bonding component includes an adhesive polyimide (column 3, line 36), the first thermoplastic bonding component includes a plurality of openings (34), the filter includes a repeating pattern of units having a plurality of openings (30, 32, Fig. 2) for the purpose of preventing particles from flowing downstream to the nozzles (Fig. 3).

Furthermore, Baker discloses the polymer sheet (30) can be used for bonding (column 3, lines 34-37).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Moynihan et al. with the thermoplastic filter and bonding material as disclosed by Baker for the purposes of preventing particles from flowing downstream to the nozzles and bonding.

Even though Moynihan et al. as modified by Baker does not disclose applying pressure to the surface and the first thermoplastic bonding component during heating, it is common knowledge to apply pressure to the bonding elements for the purpose of holding the elements in place and heating the thermoplastic material for the purpose of melting it into a bonding liquid.

Even though Moynihan et al. as modified by Baker does not disclose the first thermoplastic bonding component has a thickness between 20 microns and 50 microns, it has been held that discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In this particular instance, discovering the optimum or workable thickness would result in an optimum and workable thermoplastic filter (32).

Claims 32 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. in view of Baker as applied to claims 29 and 52 above, and further in view of DeYoung et al. (US 4,751,774).

Regarding claims 32 and 57, Moynihan et al. **as modified** by Baker discloses all the claimed limitations as discussed above except the piezoelectric element comprising lead zirconium titanate.

Nevertheless, DeYoung et al. discloses that piezoelectric element comprising lead zirconium titanate (column 5, lines 9-12). DeYoung discloses that lead zirconium titanate is a well-known piezoelectric in the art (column 5, lines 9-11).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Moynihan et al. as modified with lead zirconium

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titanate as disclosed by DeYoung et al. for the purpose of improving the availability of the piezoelectric material.

Claims 41, 42, 51, 63, and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. in view of Baker as applied to claims 29, 45, 50, and 52 above, and further in view of Admitted Prior Art of Fig. 5 (APA).

Regarding claims 41, 51, and 63, Baker further discloses the filter (30) including a repeating pattern of units (32's) having a plurality of openings (34) and a land between each pair of adjacent t units (Fig. 2).

However, Moynihan et al. **as modified** by Baker does not disclose:

- regarding claims 41, 51, and 63, the land between each pair of adjacent units is at least 50 microns.
- regarding claims 42 and 64, the filter has a width of 300 to 495 microns.

Nevertheless, APA discloses a filter (Fig. 5) has a width of 300 to 495 microns (specification, page 7, line 13).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Moynihan et al. as modified with a filter width as disclosed by APA for the purpose of obtaining an optimum and workable filter.

Even though Moynihan et al. as modified by Baker and APA does not explicitly disclose the land between each pair of adjacent units is at least 50 microns, APA discloses that the center-to-center spacing of the filter holes is 45 microns (specification, page 7, lines 11-12). It has been held that discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In this particular instance, discovering the optimum or workable spacing would result in an optimum and workable thermoplastic filter (32).

Claims 43 and 97-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. in view of Baker as applied to claims 29 and 45 above, and further in view of Kishima (US 6,109,737).

Regarding claims 43 and 97, Moynihan et al. discloses an orifice plate (14).

However, regarding claims 43, 98, and 99, Moynihan et al. does not disclose a protector strip adhered to the orifice plate, wherein either the orifice plate or the protector strip includes a thermoplastic bonding material.

Nevertheless, Kishima disclose a protector strip (251) adhered to the orifice plate (30) for the purpose of protecting the nozzle from ink adhering around the nozzle (column 35, lines 55-60), wherein either the orifice plate or the protector strip includes a

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thermoplastic bonding material (column 38, lines 50-55; Figs. 25, 74).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Moynihan et al. as modified with a protector strip adhered to the orifice plate as disclosed by Kishima for the purpose of protecting the nozzle from ink adhering around the nozzle.

### ***Response to Arguments***

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Nghiem whose telephone number is (571) 272-2277. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Michael P. Nghiem/

Primary Examiner, GAU 2863

February 12, 2008